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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,416	11/19/2003	Young-Rag Do	1568.1071	9181

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EXAMINER	
KEANEY, ELIZABETH MARIE	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/715,416	DO ET AL.	
	Examiner	Art Unit	
	Elizabeth Keaney	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22 and 24-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-8,10-17,19-22 and 24-28* is/are rejected.

7)☒ Claim(s) *3,9 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on *19 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The Amendments and Remarks filed 10 February 2006 have been entered.

Response to Arguments

The Examiner notes all definitions were obtained by Merriam-Webster OnLine (www.m-w.com) and a copy is attached with this office action.

Applicant's arguments, see page 1, filed 10 February 2006, with respect to 112, second paragraph rejection have been fully considered and are persuasive. The 112 rejection of claims 2 and 13 has been withdrawn.

Applicant's arguments regarding claims 1,4,10,11,12,19 and 20 have been fully considered but they are not persuasive.

Applicant argues that Levinson makes no mention of a corrugated surface. Applicant further argues that Levinson describes the substrate as uneven and disordered, wherein these features are contrary to the ordered features normally found in a corrugated structure.

The Examiner respectfully disagrees.

First, the definition of corrugated is "to form into alternating ridges and grooves". The definition does not require these ridges and grooves to be orderly. Therefore ordered features are not required by the claimed limitation corrugated. Further, while

the term corrugated is not used explicitly, Levinson does disclose the pattern to be undulations projecting upwards, desirably, a plurality of bumps or rounded depressions (column 3, lines 18-21). The definition of undulation is a wave-like appearance. Waves have alternating ridges and grooves and are thus considered to define a corrugated shape. Therefore, Levinson discloses a corrugated surface and the rejections are maintained.

Applicant further argues that since Levinson does not disclose a refractive index of zinc sulfide, the reference fails to disclose the zinc sulfide having a refractive index of 1.6.

The Examiner respectfully disagrees.

The refractive index of a material is an inherent property of the material. While no mention may be present within the reference, the zinc sulfide material does indeed have a reflective index of 1.6. Accordingly, the rejection is maintained.

Applicant's arguments regarding claims 2,5,6,7,8,13,14,15,16 and 17 have been fully considered but they are not persuasive.

Applicant argues that the mere fact that the substrate of Levinson could be modified to include teachings of Ito et al. (US Patent 6,677,703; hereinafter Ito) does not make the modification obvious unless the prior art suggested the desirability of the modification.

The Examiner respectfully disagrees.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it maximizes the light absorbed by the fluorescent layer, thereby necessitating less fluorescent material within the device and improving the clarity of the image produced by the display. Further, the Examiner notes the modification must only be feasible, the fact that it is done for a different purpose is irrelevant.

Applicant asserts that the Examiner has not provided any analysis which indicates that the "λ" mentioned in Ito et al. in column 9, lines 8-44 has any relationship to a "wavelength of light produced by the fluorescent layer", as recited in claims 6 and 15.

The Examiner has provided the analysis as follows:

Ito discloses in column 9, lines 14-16 "the wavelength of a light ray traveling through a medium is λ/n, where λ is the wavelength of light in a vacuum and n is the refractive index of the medium". The device taught by Levinson (all labels are drawn to figure 2) operates as follows: a voltage is applied between the electrodes (31 and 35), the electrons bombard the fluorescent layer cause the material to emit a wavelength of

light. This light then travels through the transparent substrate (the substrate is equivalent to the medium taught by Ito). Accordingly, Levinson and Ito disclose the pitch as claimed in claims 6 and 15.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,4,10,11,12,19,20 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Levinson (US Patent 4,774,435).

Re claims 1,12 and 24: Levinson discloses, in figure 2 and throughout the disclosure, an electroluminescent display device comprising:

- a substrate (30);
- a corrugated structure formed on the substrate (column 1, lines 48-49), wherein the corrugated structure disperses light through diffraction and reflection (column 3, lines 42-65); and
- a first electrode layer (31), a first insulation layer (32), a fluorescent layer (33), a second insulation layer (34) and a second electrode layer (35) sequentially formed on the substrate to follow the shape of the corrugated structure (column 3, lines 42-45).

The Examiner notes that while Levinson uses the term phosphor to describe luminescent layer, the layer is further defined as zinc sulfide with an activator of manganese. Zinc sulfide activated with manganese is a well-known fluorescent material rather then a phosphorescent material, as evidenced by Atarashi et al. (US Patent 6,666,991) (column 7, lines 34-35).

The Examiner further notes that the definition of geometric is utilizing curvilinear motif in design, the definition of curvilinear is bounded by curved lines and the definition of wave is to follow a curved line. Therefore, since Levinson discloses the substrate having wave-like projection (column 3, lines 18-21), the wave-like projections are considered to be a plurality of identifiable geometric shapes.

Re claim 4: Levinson discloses the corrugated structures formed on the inside surface of the substrate (30) therefore, since they are made of the same material, they would have the same refractive index as the substrate.

Re claims 10 and 19: Levinson discloses the fluorescent layer having a higher refractive index then the adjacent first and second insulation layers (column 3, lines 1-4).

Re claims 11 and 20: Levinson discloses a fluorescent layer of zinc sulfide activated with manganese (column 2, lines 38-40), therefore Levinson discloses a sulfide having a refractive index of more than 1.6 as a base material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2,5,6,7,8,13,14,15,16,17 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levinson as applied to claims 1 and 12 above, and further in view of Ito et al. (US Patent 6,677,703; hereinafter Ito).

Re claims 2,13 and 25-28: Levinson teaches all the features as shown above.

However, Levinson fails to teach or fairly suggest any specific shape of the rough, non-planar surface.

One of ordinary skill in the art would recognize that the shape of the corrugated structure depends upon the desired reflective and dispersion properties. Therefore, the geometric shape of the corrugated structure is merely a matter of design, as further evidenced by Ito (figure 5, column 9, line 62-column 10, line 18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a corrugated structure having a cylindrical shape or a

polygonal cone shape within the device of Levinson because it maximizes the light absorbed by the fluorescent layer thereby necessitating less fluorescent material in the device and improving the clarity of the image produced by the display.

Re claims 5 and 14: Levinson discloses the substrate material to be silicon dioxide (column 2, line 28).

Re claims 6 and 15: Ito discloses a pitch between the corrugating members of the corrugated structure is $\lambda/4$ to 4λ of a wavelength of light produced from the fluorescent layer (column 9, lines 8-44).

Re claims 7 and 16: Ito discloses the pitch between the corrugating members of the corrugated structure to be in the range of 100-2400nm (column 9, line 44).

Re claims 8 and 17: Ito discloses the minimum height of the corrugating members to be 1.5 times the maximum pitch (column 11, line 38). For example, when the maximum pitch is 250nm (column 9, line 44), the minimum height would be 1.5*250nm= 375nm which is within the range of 50-1000nm.

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levinson as applied to claim 12 above, and further in view of Yamazaki (US Patent 6,433,487).

Re claim 21: Levinson teaches all the features as shown above.

However, Levinson fails to teach or fairly suggest a thin film transistor layer driving the first electrode layer and the second electrode layer.

Yamazaki discloses, in figures 1 and 2 and throughout the disclosure, the use of a corrugated structure within an EL device in which a thin film transistor layer drives a first and second electrode layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the structure of Levinson within the device of Yamazaki because it maximizes clarity of the image produced by the device without increasing power consumption.

Re claim 22: Yamazaki discloses, in figure 2 and throughout the disclosure, a fluorescent layer comprising red, green and blue layers formed in a predetermined pattern, and being formed between the first and second electrode layer, the first and second electrode layers also formed in a predetermined pattern (column 7, lines 59-64).

Allowable Subject Matter

Claims 3,9 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: as set forth in the previous office action.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- WO 00/70691 A1

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Keaney whose telephone number is (571)272-2489. The examiner can normally be reached on Monday,Tuesday,Thursday,Friday 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571)272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elizabeth Keaney
Examiner
Art Unit 2882

EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER